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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314		

  

EXAMINER	
REDDY, KARUNA P	

  

ART UNIT	PAPER NUMBER
1713	

  

NOTIFICATION DATE	DELIVERY MODE
09/18/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/539,132	<b>Applicant(s)</b> SCHULTES ET AL.	
	<b>Examiner</b> Karuna P. Reddy	<b>Art Unit</b> 1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☒ Claim(s) 4-17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/11/2005, 6/12/2006</u> . | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Claim Objections*

1. Claims 4-17 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only and/or cannot depend from any other multiple dependent claim. See MPEP § 608.01(n).

2. Claims 8 and 11 are objected to because of the following informalities:

Claim 8 recites "...peroxodisulphate, preferably using ammonium....". It is not clear which initiator controls the metes and bounds of the claimed subject matter.

Claim 11 recites the broad recitation of "... at least one of preceding claims, ..." followed by a narrow limitation of "... in particular....". It is not clear which preceding claim limitations control the actual metes and bounds of claimed subject matter.

In claim 11 the use of phrase "obtainable by" renders unclear whether other polymers made using other specified processes are also within the claimed scope. If applicant is intending to specify a polymer that is produced by the recited process, then the phrase "obtained by" should be used.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

***Claim Rejections - 35 USC § 103***

5. Claims 1-4, 8-13 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann (US 4, 180, 529).

Hofmann discloses a multistage, sequential process for making an acrylic graft copolymer. Upon blending with a non-resilient methacrylic matrix resin, followed by molding an impact resistant molded product is obtained (abstract).

See example 9 for the process of making a three-stage resin. The proportions of

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monomers in stage 1, 2 and 3 read on the proportions of monomers of claim 1.

Preferred polymerization temperatures range from 60<sup>0</sup> to 90<sup>0</sup>C (column 3, lines 16-17). See example 1, wherein 1000 g of water is emulsified with 0.52 grams of a 72% solution of sodium dioctyl sulfosuccinate (column 5, lines 48-53) and reads on weight percentages of water and anionic emulsifier of claims 2-3.

K<sub>2</sub>S<sub>2</sub>O<sub>8</sub> i.e. potassium peroxodisulphate in demineralized water was added to initiate reaction (column 5, lines 56-58). See example 1, wherein the stage 2 and 3 monomers are metered in over a period of several minutes (column 5, lines 58-67). The acrylic graft copolymer was compounded with a methyl methacrylate (MMA) / ethyl acrylate (EA) copolymer. The MMA/EA copolymer was compounded with 62.5 percent of the graft copolymer. The blended resin was compression molded. The particle size of acrylic graft polymer was 0.155 microns (column 6, lines 28-42).

The prior art differs with respect to total weight of components A-J, based on the total weight of aqueous dispersion.

However, the proportion of monomers in examples of prior art read on the proportion of components A-J of instant invention. The amount of solvent i.e. water used to form emulsion or dispersion is within the scope of a skilled artisan and can be varied depending on the desired solids content and end use requirements, absent evidence of unexpected results.

As to the properties of claim 17, in light of the fact that prior art teaches / discloses essentially the same molding composition made by a similar process

as that of the claimed, one of ordinary skill in the art would have a reasonable basis to believe that the molding composition of prior art would exhibit essentially the same property(ies) under similar test conditions. Since PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobviousness difference. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977).

6. Claims 1-4, 8, 11-13 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Owens (US 3, 793, 402).

Owens discloses a low haze impact resistant composition containing a multi-stage, sequentially produced polymer (title). Preferably, the multi-stage polymer is a three stage composition wherein the stages are present in ranges of 10 to 40 percent by weight of the first stage (A), 20 to 60 percent of the second intermediate stage (B), and 10 to 70 percent of the final stage (C), all percentages based on the total weight of the final stage (column 2, lines 51-56). The level of emulsifier is preferably below one percent (column 4, lines 33-34). The multi-stage emulsion polymerization can be carried out at temperatures ranging preferably from 30<sup>0</sup>C to 95<sup>0</sup>C (column 4, lines 62-64). See example 1 for the proportions of monomers used to form multi-stage polymer (column 12, line 48). The monomer charge is polymerized using potassium persulfate (column 12, lines 52-53). The monomer charge is emulsified in water with sodium dioctyl sulfosuccinate as the emulsifier (column 12, lines 51-52) and reads on the

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anionic emulsifier of claim 4. The hard-core thermoplastic material is blended with 50% of poly(methyl methacrylate molding powder. The test pieces are then injection molded (column 12, line 75).

The prior art is silent with respect to total weight of components A-J, based on the total weight of aqueous dispersion.

However, the proportion of monomers in examples of prior art read on the proportion of components A-J of instant invention while the amount of water used is open ended. The amount of solvent i.e. water used to form the emulsion or dispersion is within the scope of a skilled artisan and can be varied depending on the desired solids content and end use requirements, absent evidence of unexpected results.

As to the properties of claim 17, in light of the fact that prior art teaches / discloses essentially the same molding composition made by a similar process as that of the claimed, one of ordinary skill in the art would have a reasonable basis to believe that the molding composition of prior art would exhibit essentially the same property(ies) under similar test conditions. Since PTO cannot conduct experiments, the burden of proof is shifted to the applicants to establish an unobviousness difference. See *In re Best*, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977).

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7. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann (US 4, 180, 529) or Owens (US 3, 793, 402) independently, in view of Takarabe et al (US 4, 914, 142).

The discussion with respect to Hofmann and Owens in paragraphs 5 and 6 respectively, is incorporated herein by reference.

The prior art is silent with respect to seed latex and alkyl alcohol in the aqueous emulsion.

However, Takarabe et al teach a method by which a highly monodisperse emulsion polymer having a large particle diameter can be produced while the occurrence of a coagulum or new particles during the polymerization is inhibited to a low level (column 2, lines 30-36). The object is achieved by adding a polymerizable monomer to an emulsion polymer containing a high-molecular weight compound as a seed polymer and thereafter, polymerizing the monomer in presence of a film forming aid (column 2, lines 37-46). Typical examples of the film-forming aid include ethylene glycol, isopropyl benzyl alcohol (column 3, lines 24-46). Therefore, it would have been obvious to one skilled in the art at the time invention was made to add seed polymer and film forming aid such as alcohol to the initial charge of Hofmann or Owens and obtain a highly monodisperse emulsion polymer having large particle diameter while maintaining coagulum or new particle formation at a low level.



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8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann (US 4, 180, 529) or Owens (US 3, 793, 402) independently, in view of Takarabe et al (US 4, 914, 142) as applied to claim 5 above, and further in view of DeWitt (US 4, 173, 596).

The discussion with respect to Hofmann or Owens independently, in view of Takarabe et al in paragraph 7 is incorporated herein by reference.

The prior art differs with respect to particle size of seed latex.

However, De Witt teaches improved impact modifiers prepared by emulsion polymerization in the presence of seed latex. (column 2, lines 66-68). Latex is initially provided wherein polymer particles are dispersed in an aqueous medium. These polymer particles have an average size range of from about 200 to about 2,000 Å units (column 3, lines 59-62). Therefore, it would have been obvious to one skilled in the art at the time invention was made to use seed latex with a particle size of 200 to about 2,000 Å units and obtain an improved impact modifier.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann (US 4, 180, 529) or Owens (US 3, 793, 402) independently, in view of Falk et al (US 4, 542, 179).

The discussion with respect to Hofmann and Owens in paragraphs 5 and 6 respectively, is incorporated herein by reference.

The prior art is silent with respect to the use of styrene-acrylonitrile in the molding composition.

However, Falk et al teach that addition of styrene-acrylonitrile copolymer to acrylic core-shell polymers reduces mold shrinkage and improves surface hardness. The styrene-acrylonitrile copolymer resins useful in the practice of this invention are copolymers of styrene and acrylonitrile comprising from 50 to 90% by weight of styrene and 10 to 50% by weight of acrylonitrile. Therefore, it would have been obvious to one skilled in the art at the time invention was made to add styrene-acrylonitrile, to the molding composition of Hofmann or Owens containing core-shell polymers, and obtain a mold with reduced shrinkage and improved surface hardness.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmann (US 4, 180, 529) or Owens (US 3, 793, 402) independently, in view of Shah et al (US 5, 777, 034).

The discussion with respect to Hofmann and Owens in paragraphs 5 and 6 respectively, is incorporated herein by reference.

The prior art is silent with respect to the molding composition comprising 0.1 to 10.0% by weight of another polymer with a molecular weight higher by at least 10% than that of (meth)acrylic polymer.

However, Shah et al teach a methacrylate resin blend composition having improved solvent craze resistance. The improvement is achieved in a simple

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way while retaining the blend composition's desirable properties such as weather resistance, molding, impact resistance and mechanical properties (column 1, lines 1-10). The blend composition contains a methacrylate matrix resin, particles of a single layer polymer and optionally an acrylic multi-layer polymer. The particles of a single layer polymer have a weight average molecular weight of at least 120% of the  $M_w$  of the methacrylate matrix resin component (abstract). The simple incorporation of SLP's (single layer polymer) into the methacrylate matrix resin provides the improvement in craze resistance (column 4, line 67; column 5, lines 1-3). The matrix resin will comprise 50 to 90 wt%, the impact modifier resin from 0 to 50 wt% and the single layer polymer from 1 to 50 wt% of the blend composition (column 6, lines 42-45). Therefore, it would have been obvious to one skilled in the art at the time invention was made to add a polymer having a molecular weight of at least 120% of the  $M_w$  of methacrylate resin of Hofmann or Owens, in an amount of from 1 to 50 wt% and obtain a molding composition that will exhibit improved solvent craze resistance.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karuna P. Reddy whose telephone number is (571) 272-6566.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax

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phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Karuna P Reddy  
Examiner  
Art Unit 1713

/KR/